Space Weather Forecast

Issued on Saturday, 24 September 2022 at 13:04 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of Minor Geomagnetic Storm G1 mainly day 3 due to possible CME influence. Daily chance of Minor Radio Blackouts (R1).

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity, as measured by GOES-16 and 17 satellites, has been Moderate, with a low level Moderate class flare observed from a sunspot region near the northeast limb, at 23/1810 UTC.

There are currently six numbered active regions on the visible disc, with the two largest groups currently in the southeast quadrant. The sunspot region near the northeast limb has shown some development, but the three regions in the western hemisphere are smaller, with little change in overall development.

Previously analysed CMEs from 21st and 22nd may give some glancing influence at Earth late on the 25th and into 26th, however confidence is low.

A large filament eruption and CME observed around 23/1400 UTC has been analysed and misses Earth. A CME associated with the Moderate class flare has also been assessed as missing Earth. A new CME is now seen emerging on coronagraph imagery from the southwest limb. Initial viewing indicates this should be directed off the Sun-Earth line, but modelling will be undertaken when further imagery becomes available to confirm this.

Solar Wind / Geomagnetic Activity: The solar wind, as measured by DSCOVR and ACE at L1, was at mostly slightly elevated levels and showed a slight rising trend which levelled off after approximately 23/2100UTC. The number of particles comprising the wind was mainly average with a slight downward trend. The magnetic field associated with the wind was at Weak levels, with the important north/south component often in the south pointing orientation. Corresponding geomagnetic activity was mostly Quiet to Unsettled (Kp 1 to 3), with an Active (Kp 4) interval 24/0300-0600UTC.

Energetic Particles / Solar Radiation: No solar radiation storms were observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is forecast to be low to moderate, with further common-class flares expected with an ongoing daily chance (50%) of moderate-class flares. The main flare risk remains from the southeastern quarter of the Sun.

Solar Wind / Geomagnetic Activity: This forecast period comprises a waning coronal hole fast wind, up to two low confidence CMEs on days two and three (25th and 26th), and perhaps some further limited coronal hole influence from late in the period.

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Ongoing coronal hole influence still gives a slight chance of G1 on Day 1 (24th). This should wane into days 2 and 3, however there is a low chance of reaching G1 late day 2, and into day 3 from possible glancing CME influence. Potential influence from a southern coronal hole late in the period should be limited, with G1 currently assessed as being unlikely. In summary, geomagnetic activity is likely to remain mostly below G1 level through the period.

Energetic Particles / Solar Radiation: No solar radiation storms are expected, although there is a very slightly increasing risk due to the usual westward advance of the more active sunspot groups across the facing side of the Sun.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	20	10	30	10
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	50	50	50	50
Very Active	R3 to R5 X	No	5	5	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	5	5	5	5
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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